CLAIMS

WHAT IS CLAIMED IS:

1. A pharmaceutical composition comprising:

(a) an amount of at least one acid labile proton pump inhibitor; and

(b) at least one buffering agent in an amount sufficient to inhibit or reduce degradation of at least some of the proton pump inhibitor,

wherein the composition is administered to a subject prior to a meal and is in an amount effective to maintain gastric pH greater than about 4.0 for at least about 1 hour following the meal.

2. The pharmaceutical composition of claim 1, wherein the composition is in an amount effective to increase the gastric pH of the subject to at least about 3 prior to the meal.

3. The pharmaceutical composition of claim 1, wherein the composition is in an amount effective to increase the gastric pH of the subject to at least about 3 prior within 30 minutes after administration.

4. The pharmaceutical composition of claim 1, wherein a therapeutically effective amount of the proton pump inhibitor is absorbed within about 1 hour after administration.

5. The pharmaceutical composition of claim 1, wherein at least some of the proton pump inhibitor is not enteric-coated.

6. The pharmaceutical composition of claim 1, wherein the composition is in an amount effective to maintain gastric pH greater than about 4.5 for at least about 1 hour following the meal.

7. The pharmaceutical composition of claim 1, wherein the maximum pH is reached within about 30 minutes after administration of the composition.

8. The pharmaceutical compostion of claim 1, wherein the maximum pH is reached within about 15 minutes after administration of the composition.

9. The pharmaceutical composition of claim 1, wherein the gastric pH is greater than 4.0 at least about 50% of a time period up to seven hours.

10. The pharmaceutical composition of claim 1, wherein the gastric pH is greater than 4.0 at least about 75% of a time period up to seven hours.

11. The pharmaceutical composition of claim 1, wherein the amount of proton pump inhibitor is about 5 to about 500 mg.

12. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is about 10 mg.

13. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is about 20 mg.

14. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is about 40 mg.

15. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is about 80 mg.

16. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is selected from the group consisting of omeprazole, hydroxyomeprazole, esomeprazole, tenatoprazole, lansoprazole, pantoprazole, rabeprazole, dontoprazole, habeprazole, perprazole, ransoprazole, pariprazole, leminoprazole; or a free base, free acid, salt, hydrate, ester, amide, enantiomer, isomer, tautomer, polymorph, derivative, or prodrug thereof.

17. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor comprises omeprazole, or a free base, free acid, salt, hydrate, ester, amide, enantiomer, isomer, tautomer, polymorph, derivative, or prodrug thereof.

18. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor comprises lansoprazole, or a free base, free acid, salt, hydrate, ester, amide, enantiomer, isomer, tautomer, polymorph, derivative, or prodrug thereof.

19. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor comprises esomeprazole, or a free base, free acid, salt, hydrate, ester, amide, enantiomer, isomer, tautomer, polymorph, derivative, or prodrug thereof.

20. The pharmaceutical composition of claim 1, wherein the at least about 50% of total area under a serum concentration time curve (AUC) for the proton pump inhibitor occurs within about 1.75 hours after administration of a single dose of the composition to the subject.

21. The pharmaceutical composition of claim 1, wherein the at least about 50% of total area under a serum concentration time curve (AUC) for the proton pump inhibitor occurs within about 1.0 hour after administration of a single dose of the composition to the subject.

22. The pharmaceutical composition of claim 1, wherein the proton pump inhibitor is encapsulated with a material that enhances the shelf-life of the pharmaceutical composition.

23. The pharmaceutical composition of claim 1, wherein the buffering agent is selected from the group consisting of an amino acid, an alkali metal salt of an amino acid, aluminum hydroxide, aluminum hydroxide/magnesium carbonate/calcium carbonate co-precipitate, aluminum magnesium hydroxide, aluminum hydroxide/magnesium hydroxide co-precipitate, aluminum hydroxide/sodium bicarbonate coprecipitate, aluminum glycinate, calcium acetate, calcium bicarbonate, calcium borate, calcium carbonate, calcium citrate, calcium gluconate, calcium glycerophosphate, calcium hydroxide, calcium lactate, calcium phthalate, calcium phosphate, calcium succinate, calcium tartrate, dibasic sodium phosphate, dipotassium hydrogen phosphate, dipotassium phosphate, disodium hydrogen phosphate, disodium succinate, dry aluminum hydroxide gel, L-arginine, magnesium acetate, magnesium aluminate, magnesium borate, magnesium bicarbonate, magnesium carbonate, magnesium citrate, magnesium gluconate, magnesium hydroxide, magnesium lactate, magnesium metasilicate aluminate, magnesium oxide, magnesium phthalate, magnesium phosphate, magnesium silicate, magnesium succinate, magnesium tartrate, potassium acetate, potassium carbonate, potassium bicarbonate, potassium borate, potassium citrate, potassium metaphosphate, potassium phthalate, potassium phosphate,

potassium polyphosphate, potassium pyrophosphate, potassium succinate, potassium tartrate, sodium acetate, sodium bicarbonate, sodium borate, sodium carbonate, sodium citrate, sodium gluconate, sodium hydrogen phosphate, sodium hydroxide, sodium lactate, sodium phthalate, sodium phosphate, sodium polyphosphate, sodium pyrophosphate, sodium sesquicarbonate, sodium succinate, sodium tartrate, sodium tripolyphosphate, synthetic hydrotalcite, tetrapotassium pyrophosphate, tetrasodium pyrophosphate, tripotassium phosphate, trisodium phosphate, trometamol, and mixtures thereof.

24. The pharmaceutical composition of claim 1, wherein the buffering agent is selected from sodium bicarbonate, calcium carbonate, magnesium hydroxide, and mixtures thereof.

25. The composition of claim 1, wherein the buffering agent is present in an amount from about 0.1 mEq/mg to about 5 mEq/mg of the proton pump inhibitor.

26. The composition of claim 1, wherein the buffering agent is present in an amount from about 0.4 mEq/mg to about 1.5 mEq/mg of the proton pump inhibitor.

27. The composition of claim 1 comprising from about 200 to about 2000 mg of buffering agent.

28. The pharmaceutical composition of claim 1, wherein the composition is in the form of a powder, a tablet, a bite-disintegration tablet, a chewable tablet, a caplet, a capsule, an effervescent powder, a rapid-disintegration tablet, or an aqueous suspension or emulsion.

29. A pharmaceutical composition of claim 1, wherein at least some of the proton pump inhibitor is microencapsulated.

30. A pharmaceutical compositin of claim 1, wherein at least some of the proton pump inhibitor is micronized.

31. A pharmaceutical compostion of claim 1, wherein at least some of the proton pump inhibitor is coated.

32. The pharmaceutical composition of claim 1, further comprising an excipient.

33. The pharmaceutical composition of claim 32, wherein said excipient is selected from the group consisting of a parietal cell activator, erosion facilitator, flavoring agent, sweetening agent, diffusion facilitator, antioxidant and a carrier material selected from a binder, suspending agent, disintegration agent, filling agent, surfactant, solubilizer, stabilizer, lubricant, wetting agent, diluent, anti-adherent, and antifoaming agent.

34. A pharmaceutical composition comprising:

(a) an amount of at least one acid labile proton pump inhibitor; and

(b) at least one buffering agent in an amount sufficient to inhibit or reduce degradation of at least some of the proton pump inhibitor,

wherein the composition is administered to a subject before a meal and causes a increase in gastric pH to at least about 3.0 within about 30 minutes after administration.

35. The pharmaceutical composition of claim 34, wherein a therapeutically effective amount of the proton pump inhibitor is absorbed within about 1 hour after administration of the composition.

36. A pharmaceutical composition comprising:

(a) a therapeutically effective amount of at least one acid labile proton pump inhibitor; and

(b) at least one buffering agent in an amount sufficient to inhibit or reduce degradation of at least some of the proton pump inhibitor by gastric fluid,

wherein the composition is in an amount effective to reduce or inhibit upper GI bleeding following administration to the subject.

37. The composition of claim 36, wherein the pharmaceutical composition is in a liquid form and reduces mortality or nosocomial pneumonia due to upper GI bleeding, or a complication associated with upper GI bleeding.

38. A method of administering a compound according to claim 1 for the treatment of a gastric acid related disorder.

39. The method according to claim 38, wherein the gastric acid related disorder is duodenal ulcer disease, gastric ulcer disease, gastroesophageal reflux disease, erosive esophagitis, poorly responsive symptomatic gastroesophageal reflux disease, pathological gastrointestinal hypersecretory disease, Zollinger Ellison syndrome, heartburn, esophageal disorder, or acid dyspepsia.

40. A method of preventing or inhibiting breakthrough of pH control in a subject by administering a compund according to claim 1, wherein the subject has previously been administered a compound within about the past 2-22 hours that increases gastric pH to above 3, thereby preventing or inhibiting breakthrough of pH control.

41. The method of claim 40, wherein the composition is administered before retiring to bed.

42. The method of claim 40, wherein the composition is administered to treat or prevent nocturnal heartburn.

43. The method of claim 40, wherein integrated gastric acidity of the subject is reduced by at least about 25-500%.

44. A method of rapidly reducing production of gastric acid in a subject by administering a composition according to claim 1.

45. A method of treating a gastric acid related disorder induced by a meal by administering a composition according to claim 1 prior to the meal, wherein the amount of proton pump inhibitor is effective to reduce or inhibit one or more symptoms of the gastric acid related disorder in the subject.

46. A method of treating a gastric acid related disorder induced by a meal in a subject by administering to the subject within about 4 hours following ingestion of the meal a composition comprising,

(a) at least one acid labile proton pump inhibitor; and

(b) at least one buffering agent in an amount sufficient to inhibit or reduce degradation of at least some of the proton pump inhibitor,

wherein the amount of proton pump inhibitor is effective to reduce or inhibit one or more symptoms of the gastric acid related disorder in the subject.

47. A method of treating a critically ill subject having or at risk of having upper GI bleeding or a symptom associated with upper GI bleeding comprising administering to the subject a liquid formulation comprising:

(a) at least one acid labile proton pump inhibitor; and

(b) at least one buffering agent in an amount sufficient to inhibit or reduce degradation of at least some of the proton pump inhibitor,

wherein the amount of proton pump inhibitor is effective to reduce or inhibit upper GI bleeding or the symptom associated with upper GI bleeding in the critically ill subject.

48. The method of claim 47, wherein the subject has a nasogastric (NG) tube or a gastric tube.

49. The method of claim 47, wherein the incidence, severity, duration or frequency of upper GI bleeding or one or more symptoms associated with upper GI bleeding is reduced in the subject.

50. The method of claim 47, wherein clinically significant bleeding is reduced in the critically ill subject.

51. The method of claim 47, wherein mortality or nosocomial pneumonia associated with upper GI bleeding is reduced in the critically ill subject.

52. A method of treating a subject having or at risk of having a gastric acid related disorder, said subject having difficulty swallowing a pill, capsule or tablet by administering a pharmaceutical composition according to claim 1, wherein the composition is administered in a liquid form.

53. A method for treating heartburn by administering a pharmaceutical composition according to claim 1.